

78597
Ilmenite Basalt
319 grams



Figure 1: Photo of 78597. Scale in cm. S73-21421

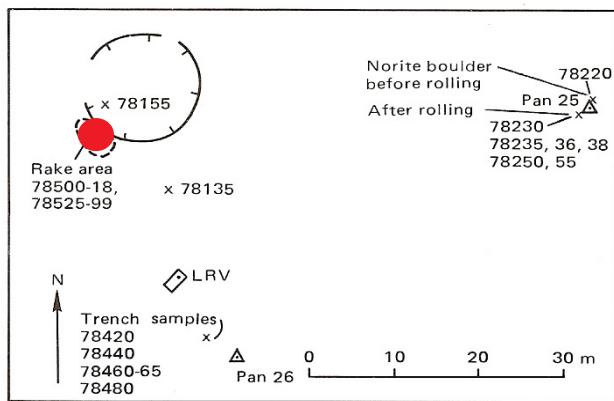


Figure 2: Location where 78597 was found.

Introduction

78597 is a vuggy, medium-grained high-Ti basalt (figure 1 and 3). It was collected as part of a rake sample and large comprehensive sample at station 8, Apollo 17 (figure 2).

Petrography

78597 is an olivine-microporphritic ilmenite basalt with large olivine grains set in a predominantly variolitic groundmass (figure 5). Plagioclase laths in the groundmass have hollow cores (interfaciculate) and are bundled in sheaths with intergrown pyroxene. Ilmenite occurs in chains. Trace tranquillityite has been reported (Warner et al. 1978).

Chemistry

Warner et al. (1975) and Rhodes et al. (1976) reported the chemical composition of 78597 (table 1, figures 6,

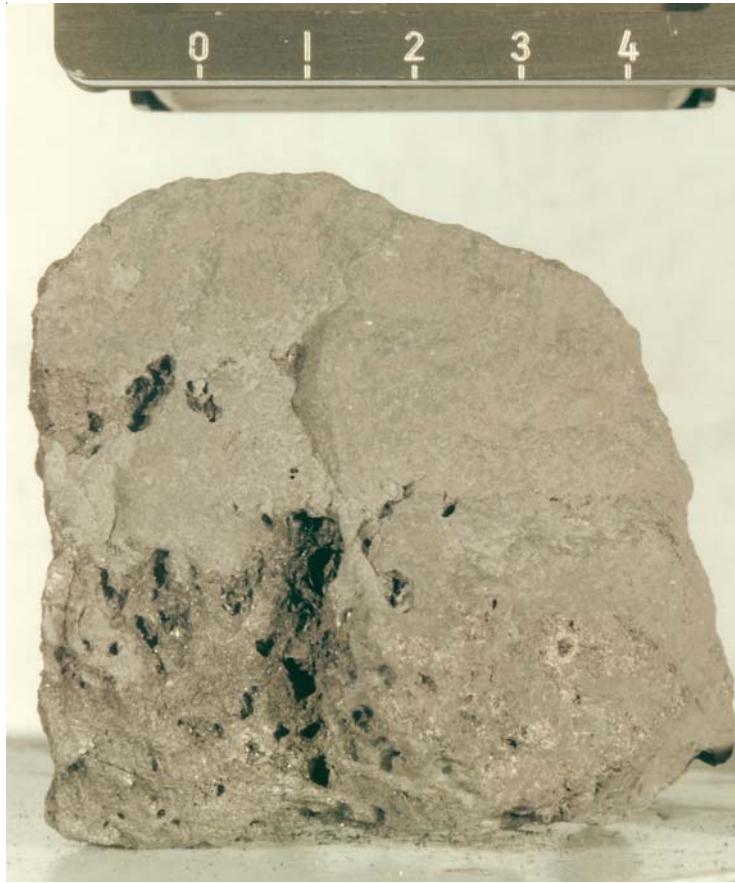


Figure 3: Phot of 78597. Scale in cm. S73-21422

7 and 8). Note that the Rb content is low, compared with other Apollo 17 basalts.

Gibson et al. (1976) reported 1990 ppm S.

Radiogenic age dating

Nyquist et al. (1976) studied the Rb-Sr isotope system, but did not determine an age. However, the age of Apollo 17 basalt is 3.72 b.y.

Cosmogenic isotopes and exposure ages

O'Kelley et al. (1974) determined the cosmic-ray-induced activity of ^{22}Na = 33 dpm/kg., ^{26}Al = 48 dpm/kg., ^{46}Sc = 25 dpm/kg., ^{54}Mn = 80 dpm/kg and ^{56}Co = 80 dpm/kg.

Processing

There is only one (small) thin section of 78597.

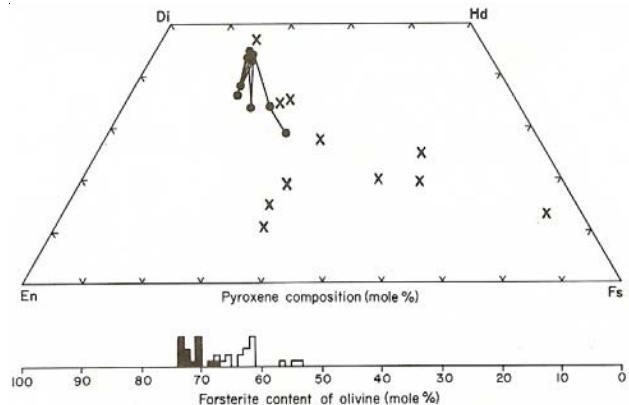


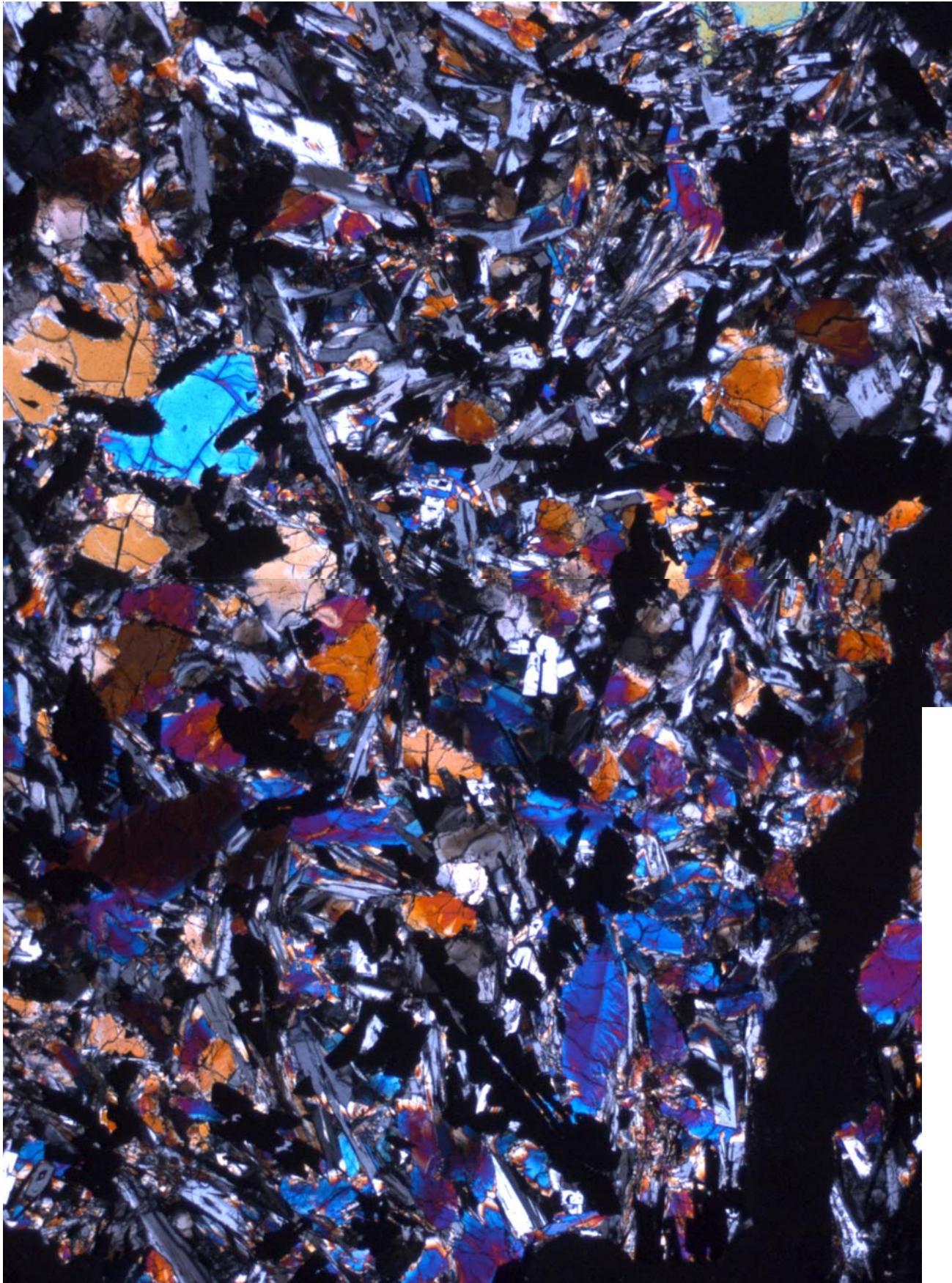
Figure 4: Composition of olivine and pyroxene in 78597 (Warner et al. 1978).

Mineralogical Mode

Olivine	5.9
Pyroxene	42.2
Plagioclase	29.5
Opaques	16.5
Silica	5.4
Moestasis	0.5



Figure 5: Photomicrograph of thin section 78597, 11. 2.8 mm across



Lunar Sample Compendium
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Table 1. Chemical composition of 78597.

reference	Eldridge74	Rhodes76	Warner75
weight		Nyquist76	
SiO ₂ %		38.54 (d)	
TiO ₂		12.39 (d) 11.8	(b)
Al ₂ O ₃		8.85 (d) 9	(b)
FeO		19.67 (d) 18	(b)
MnO		0.29 (d) 0.24	(b)
MgO		7.83 (d) 7.1	(b)
CaO		10.94 (d) 10.7	(b)
Na ₂ O	0.046	(a) 0.04 (d) 0.06	(b)
K ₂ O		0.11 (d)	
P ₂ O ₅		0.19 (d)	
S %			
sum			
Sc ppm		85 (b) 75	(b)
V		100 (b)	
Cr		2190 (d)	
Co		20.7 (b) 18.5	(b)
Ni			
Cu			
Zn			
Ga			
Ge ppb			
As			
Se			
Rb	0.37	(c)	
Sr	130	(c)	
Y			
Zr			
Nb			
Mo			
Ru			
Rh			
Pd ppb			
Ag ppb			
Cd ppb			
In ppb			
Sn ppb			
Sb ppb			
Te ppb			
Cs ppm			
Ba	60.6	(c)	
La	5.67	(c) 5.3	(b)
Ce	17.9	(c) 18	(b)
Pr			
Nd	18.8	(c)	
Sm	7.17	(c) 7.3	(b)
Eu	1.48	(c) 1.4	(b)
Gd	11.2	(c)	
Tb		1.9	(b)
Dy	13	(c) 12	(b)
Ho			
Er	7.94	(c)	
Tm			
Yb	7.37	(c) 6.7	(b)
Lu	1.07	(b) 1	(b)
Hf	6.8	(b) 6.2	(b)
Ta		1.5	(b)
W ppb			
Re ppb			
Os ppb			
Ir ppb			
Pt ppb			
Au ppb			
Th ppm	0.38	(a)	
U ppm	0.11	(a)	
technique:	(a) radiation count., (b) INAA, (c) IDMS, (d) XRF		

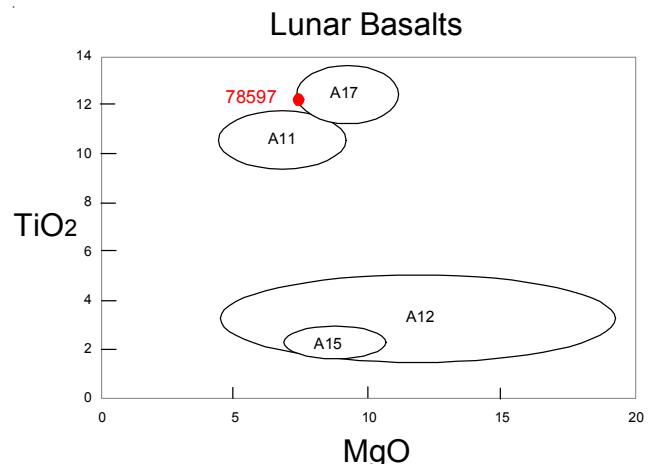


Figure 6: Composition of lunar basalts.

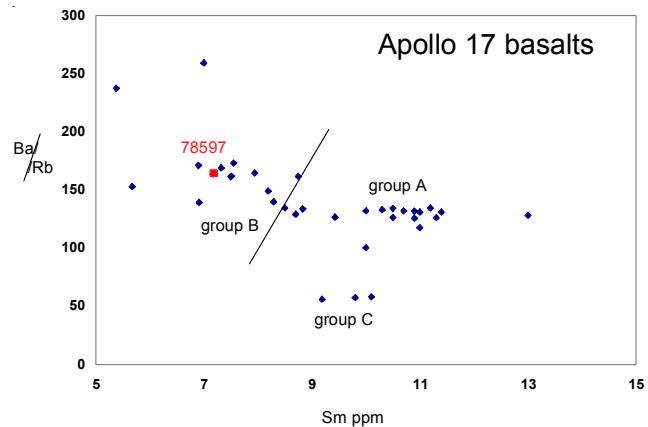


Figure 7: Trace element characteristics of Apollo 17 basalts.

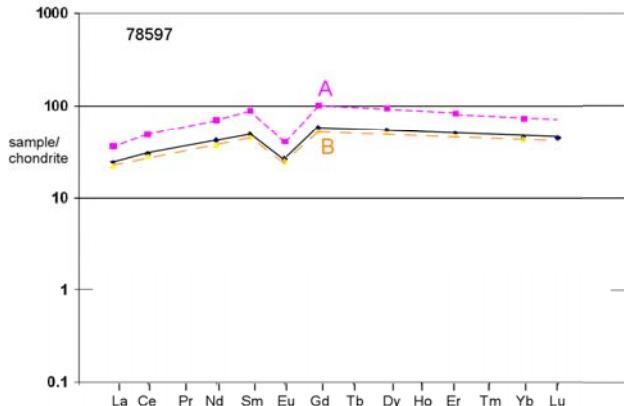
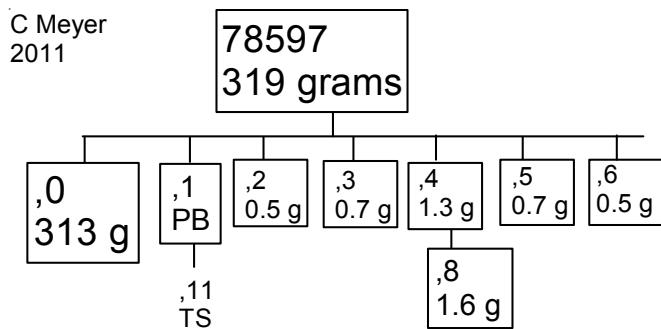


Figure 8: Normalized rare-earth-element diagram for 78597 compared with A and B types of Apollo 17 basalt.



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